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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/528,137 | 12/12/2005 | Takashi Ozaki | 050161 | 2307 |
| 23850 7590 11/23/2010 KRATZ, QUINTOS & HANSON, LLP 1420 K Street, N.W. 4th Floor WASHINGTON, DC 20005 | | | | |
| EXAMINER | | | | |
| MACARTHUR, SYLVIA | | | | |
| ART UNIT | | PAPER NUMBER | | |
| 1716 | | | | |
| MAIL DATE | | DELIVERY MODE | | |
| 11/23/2010 | | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/528,137

Applicant(s)

OZAKI ET AL.

Examiner

Sylvia R. MacArthur

Art Unit

1716

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 March 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7-18 and 21-28 is/are pending in the application.
- 4a) Of the above claim(s) 9-17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7,8,18 and 21-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/9/2010 has been entered.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1, 3-5, 7, 8, 18, and 21-28 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 1, 3-5, 7, 8, 18, and 21-28 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: Applicant recited a seal cap and a cover but fails to recite that the cover is below or under the seal cap.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 3,4, 8,18,21-25, 27, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Shibata et al (US 5,478,397).

7. The prior art of Shibata et al teaches a heat treating device.

Regarding claim 1: The device of Shibata including a processing vessel for exposing wafers held in a wafer boat for heat treatment, processing gas introduction nozzles 50 (a plurality of feed openings is taught in the abstract and the paragraph that joins columns 3 and 4). The apparatus of Shibata et al features a furnace 2, seal cap 48 (see col. 3 lines 60, air tight is interpreted as hermetically), a cover 56 (spacer member), a small chamber is formed by a space enclosed by the seal cap, cover and the inner wall surface of the furnace see Fig. 1 as shown below, and a flow outlet (62,64, see Fig. 3 below) is formed by a clearance between the cover and inner wall surface of the furnace, making the first gas supplied to the small chamber flow into the furnace.

Regarding claim 3: The apparatus of Shibata et al further includes a process tube, a furnace opening flange (6B).

Regarding claims 4 and 22: See the inlet flange 10A and base flange 10B of Shibata et al.

Regarding claims 8 and 28: See col. 6 lines 40-50 wherein Shibata et al recites that the process gases are dichlorosilane and ammonia in order to deposit silicon nitride. Since the apparatus is held to heat treating which is also known as thermal CVD the limitations of claims 8 and 28 are met.

Regarding claim 18: The method of using the apparatus of Shibata et al also reads on the limitations of this claim see Shibata in its entirety esp. load/unload step in col. 4 lines 25-35.

Regarding claim 21: See col. 5 lines 53-62 wherein the spacing between the nozzles is taught.

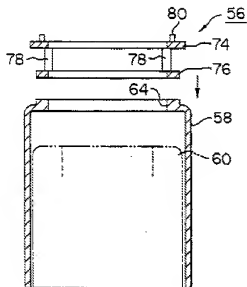


Fig. 3 of Shibata et al

8. Claims 1, 3-5, 8,18,21-25, 27, and 28 are rejected under 35 U.S.C. 102(b) as being anticipated by Hanashima et al (JP 2002-110562), using the examiner provided Machine Generated English Translation).

9. The prior art of Hanashima et al teaches a semiconductor manufacturing device.

Regarding claim 1: The device of Hanashima including a processing tube 1 for exposing wafers held in a wafer boat for heat treatment, first and second feed openings 9 and 10. The apparatus of Hanashima et al features a furnace, seal cap 20 (see the provided English Translation section [0012], a cover 23 (wafer boat end board), a small chamber is formed by a space enclosed by the seal cap, cover and the inner wall surface of the furnace see Fig. 1 as shown below, and a flow outlet is formed by a clearance between the cover and inner wall surface of the furnace, making the first gas supplied to the small chamber flow into the furnace.

Regarding claim 3: The apparatus of Hanashima et al further includes a process tube 1, a furnace opening flange (6).

Regarding claims 4 and 22: See the inlet flange and base flange of Hanashima et al (examiner's interpretation of these parts provided below.

Regarding claims 8 and 28: See section [022]wherein Hanashima et al recites that the process gases are dichlorosilane and ammonia in order to deposit silicon nitride. Since the apparatus is held to heat treating which is also known as thermal CVD the limitations of claims 8 and 28 are met.

Regarding claim 18: The method of using the apparatus of Hanashima et al also reads on the limitations of this claim see Hanashima in its entirety.

Regarding claims 5 and 21: See Fig. 1 of Hanashima et al wherein the spacing between the nozzles 9 and 10 is shown.

Regarding claim 23: The ring-shaped protrusion (see this is pointed out by the examiner below) is present see Fig. 1.

Regarding claims 24, 25, and 27: See Fig. 1.

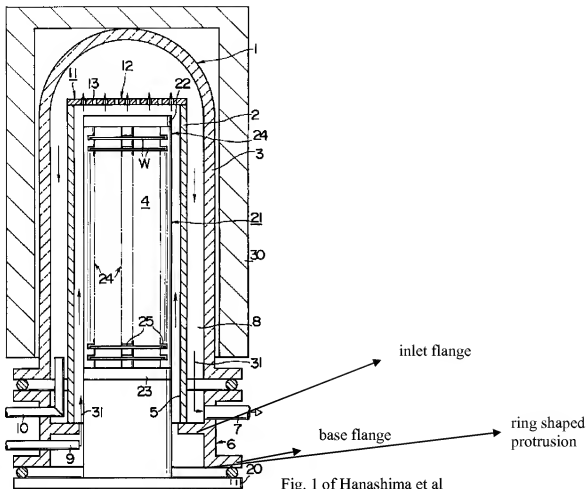


Fig. 1 of Hanashima et al

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 7 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanashima et al) in view of Yang et al (US 6,953,739).

12. The teachings of Hanashima et al were provided below. Hanashima et al teaches a boat holding multiple substrates see section [011],but fails to teach that the boat is rotated.

13. The prior art of Yang et al teaches a furnace with a wafer boat 53 for support a plurality of wafers that are horizontally oriented, see Figures and col. 7 lines 6-21 wherein Yang et al teaches a rotating shaft 57. The teaching of Yang et al supports the notion that a rotating boat is known in the art. The motivation to modify the apparatus of Hanashima et al to rotate the boat is that rotation of the boat allows the wafers to be rotated during treatment which enhances treatment uniformity along the surfaces of the plurality of wafers. Thus, it would have been obvious for one of ordinary skill in the art at the time of the claimed invention to modify the apparatus of Hanashima et al to rotate the boat as taught by Yang et al.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sylvia R. MacArthur whose telephone number is 571-272-1438. The examiner can normally be reached on M-Th during the hours of 8 a.m. and 4:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571-272-1435. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

November 20, 2010

/Sylvia R MacArthur/
Primary Examiner, Art Unit 1716